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less numbers. We find, too, that we have lost many of the grandest elements in the Tertiary flora ; for example, our sycamores (*Platanus occidentalis*, and *P. racemosus*,) were in Tertiary times represented by a half dozen species which are now extinct, and of these, two at least would seem to have surpassed in magnitude and beauty our common one, great and grand as it is; for I have leaves of two extinct sycamores that are each one and a half feet in diameter. Camphor trees, palms, and figs were also features in our Tertiary flora which exist no longer outside of the tropics.

The most potent influence which operated to change the flora of the Tertiary to that of the present day was undoubtedly the cold of the Ice period. Although less destructive here than in Europe, because the southern extension of our continent offered a place of retreat before the advancing ice-sheet, the substitution of an Arctic climate for the mild temperature which prevailed in Tertiary times throughout the northern portion of the continent, and the spread of unbroken fields of snow and ice over all the surface north of the fortieth parallel, caused the destruction of all plant life over three-fourths of the area covered with the luxuriant growth of the Tertiary vegetation. It also forced the remnant into such narrow quarters that vast numbers of species were exterminated, and left the flora in the fragmentary condition it now exhibits. The effect upon the fauna was still more disastrous, for a forest tree needs no greater space than is occupied by its roots in the earth and its branches in the air, while the surface required for the support of one of the larger mammals is much greater. Hence of the grand Tertiary fauna scarce a remnant survived, while of the plants, when better days returned, and the snow fields and ice-sheets retreated to Greenland, a sufficient number came back from their banishment to cover the central portion of the continent with a flora which retained all the essential botanical characters of that of the Tertiary, but the vicissitudes through which it had passed had told sadly upon it. Many of its grandest and most beautiful elements had disappeared forever, while a few of its magnolias, tulip trees, sequoias and liquidambars survive as solitary representatives of the groups to which they once belonged, and form groves instead of boundless forests. Overtopping in their grandeur, or outshining in their beauty, their present associates, they attest the general magnificence of those ancient forests that were composed of their progenitors and extinct relatives, their equal or superiors.

§ 58. **Adiantum Capillus-Veneris,** L., in Kentucky.--On the 28th of last month I received the following letter from Mr. Linney, containing a small piece of this fern.

Harrodsburg, Ky.

" Dear W.—Mr. E. H. Gaither of this place found last week under a cascade, ½ mile from Burnside's Point, Pulaski Co., great quantities of *A. Capillus-Veneris*, if that is this form. Yours,

W. M. Linney."

I at once wrote to Mr. Linney to send me the best specimen he could get from Mr. Gaither, and to give me all the particulars about the locality. He sent me four very good plants, two of them measuring

15 inches in length, including stipe. Regarding the locality, he further says: "The Cincinnati Southern R. R. crosses the Cumberland River in Pulaski Co., ½ a mile down from the bridge, where there is a cascade falling over sub-carboniferous rocks. Within, around, and beneath the fall is the *Adiantum* growing in great profusion."

I intend visiting the locality in about two or three weeks and will then write full particulars. JOHN WILLIAMSON.

Louisville, Ky.

§ 59. **A Large Chestnut Tree.**—A fine specimen of *Castanea vesca*, L., var. *Americana*, Michx., stands in the township of New Barbadoes, Bergen County, N. J., half way between River Edge and New Milford stations on the N. J. and N. Y. R. R. about one hundred feet east of the railroad. The circumference at six feet from the ground is eighteen feet, which is slightly increased up to the first ramification at the estimated height of twenty-five feet. The very spreading and declining branches, themselves as large as ordinary trees, cover a space of ground not less than seventy-five feet in diameter. The tree is perfectly sound.

W. H. RUDKIN.

§ 60. **On the Northward Extension of the N. J. Pine Barren Flora on Long and Staten Islands.**—The famous Pine Barren region of N. J. extends with few interruptions all the way from the Lower Bay of New York to Cape May and the mouth of the Delaware River. It occupies a narrow belt, near the Atlantic coast with its northern portion, but expands as it extends southward so as to include nearly the whole of Southern New Jersey. The Flora of this section of North America has long been widely known to include some of the rarest and most beautiful plants to be found on our continent, and has, therefore, been thoroughly explored by botanists from all sections of the country.

The soil of this region, as all who have travelled through it will bear witness, is generally extremely sandy, but is occasionally more firm, in places where strata of clay approach and form the surface.

The ages of the geological formations which occupy this territory are, Tertiary in the portion lying to the south and south-east of a line drawn from a point on the Atlantic coast a few miles south of Long Branch, to another near the head of Delaware Bay; and Cretaceous, north of this line, and extending between it, and the southern edge of the Triassic formation, which follows a line from the centre of Staten Island to the vicinity of Trenton.

As the soil over both the Cretaceous and Tertiary is composed of similar materials, it is impossible to say, from surface indications just where one ends and the other begins.

The Tertiary pine barrens extend southward along the Atlantic coast to Florida; it is with the Flora of the northern extension of these sandy stretches, of *Cretaceous* age, with which we have to do at present. On Staten Island these strata are exposed in its extreme southern portion, occupying an area of perhaps one-fifteenth of the county; they doubtless extend over the entire southern and eastern